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Understanding the healthcare burden of illness in moderate-, late-preterm and term neonates: pilot stages

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13/12/2023

Recruitment status
No longer recruiting

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16/02/2024

Overall study status
Completed

Last Edited
20/03/2024

Condition category
Pregnancy and Childbirth

[X] Prospectively registered
[X] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[_] Record updated in last year

Plain English summary of protocol

Background and study aims
Every year in the UK, about 650,000 babies are born after 32 weeks of pregnancy. Approximately 90,000 of these babies end up in NHS neonatal units, while the rest receive care in different settings. Research has shown that not all neonatal unit admissions are necessary, and with the right support, these babies could be cared for alongside their mothers. However, there's a lack of clear guidance for healthcare professionals on how to care for these babies, leading to variations in care. This is concerning because it means similar babies may receive different and inappropriate care based on factors like location or ethnicity. This is a significant concern because this group includes over 98% of all live births and around 90% of neonates admitted to neonatal care. Some babies may be affected throughout their lives by early sickness, making it crucial to address these care disparities. Babies from ethnic minorities or deprived populations are more likely to be unwell after birth, highlighting the need to reduce this inequality. Unfortunately, most neonatal research excludes these babies, hindering efforts to improve their care. To address this, the neoOUTCOMES research project aims to improve care for these vulnerable babies. The main aim of this preparatory work is to gather information for future research that will link existing databases to enhance care and outcomes for babies born after 32 weeks of pregnancy.

Who can participate?
Moderately-, late-preterm and term neonates admitted to a neonatal unit; former neonates born after 32+0 weeks+days, parents (mothers, fathers, parents of admitted neonates, parents of non-admitted neonates), healthcare professionals and representatives of wider society.

What does the study involve?
For the two projects the specific objectives are as follows:
In the descriptive study we will describe which babies born after 32 weeks of pregnancy are admitted to neonatal units in England and Wales. We will also look at how rates of neonatal unit admission are affected by factors related to the babies (such as their gestational age at birth or ethnicity) and to the organisation of healthcare provision (such as which hospital they are born in) and explore whether some of the variability in neonatal admissions are not related to the

baby who is admitted: this will tell us whether different babies are getting different (and possibly inappropriate) care. Finally, we will describe neonatal core outcomes in babies born after 32 weeks of pregnancy who are admitted to a neonatal unit.

In the engagement project, we will describe the viewpoints of former patients, parents, and wider society on the linkage between existing data to evaluate the impact of healthcare provided to neonates born after 32 weeks. We will also identify any specific concerns former patients, parents, and wider society have with the proposed linkage work and discuss possible solutions.

The first study will map how babies born after 32 weeks are treated in neonatal units, and what outcomes they then experience. This will use routinely collected data from babies born between 2015 and 2022. Data is collected routinely for all babies who are admitted to a neonatal unit and held in the National Neonatal Research Database (NNRD). This data includes background information on the babies (such as how much they weigh at birth), their families (such as any medical problems the mother had during pregnancy), the care they are given (such as medications they are given), and the health problems these babies eventually have (such as infections like sepsis). All information held in the NNRD has had any identifying details removed, so no baby can be identified. This data can be used to better understand this large group of babies so that we can understand which babies are admitted to neonatal units, and why they are admitted. It can also be used to understand the results of this care by measuring how often these babies have important outcomes (such as death, bloodstream infections, or long-term difficulties with their development). Fully understanding what is happening now to these babies is the first step towards improving the care similar babies are given in the future. In the overarching project, this will then be extended to include non-admitted babies and later important outcomes (such as school performance) by linking to data relating to childhood health and education held in other databases.

The engagement work will explore the viewpoints of former patients, families and wider society to the proposed linkage work. For this work to go ahead it is crucial to understand whether it is wanted and acceptable to families and wider society, particularly because given the huge number of babies and mothers whose data will be used it will not be possible to get permission from all of those involved. Instead, the suggested linkage will need approval from regulators: the best way to get this approval is to ensure that this work is co-designed with families from the start so that it is clearly shown that the work is wanted and needed, and any concerns can be addressed. To understand the views of these groups fully we are going to run focus groups, an online survey, and targeted interviews. This will allow detailed but broad input from a diverse range of participants to guide the future overarching work.

What are the possible benefits and risks of participating?
This descriptive research will map the care and outcomes given to a neglected group of vulnerable babies and show where this care is not being given according to the best available evidence. The engagement project will make the viewpoints of former patients and families known so that future research can be planned to address their concerns.

This work will also inform the overarching neoOUTCOMES research project which will show how best babies born after 32 weeks should be cared for: this will reduce the inequality that babies requiring early medical care face, helping this large group to thrive.

We believe that this project raises no significant ethical, legal or management risks and does not generate any significant burdens.

The descriptive study will only use deidentified data already held within the NNRD. This database is REC-approved (REC Reference: 16/LO/1093) and all data is stored on NHS servers. Data protection and confidentiality will be maintained according to the principles established in the NNRD REC application:
• No identifiable data will be available to the study team at any point.
• De-identified data will be held within the secure Information Technology systems of Imperial College London.
• All staff accessing de-identified data will comply with institutional guidelines regarding confidentiality, data protection and research conduct.
• This will be monitored and reviewed according to the procedures laid out in the Imperial College London Information Governance policies.

The stakeholder engagement project will only involve the voluntary participation of consenting adults. Participants may find that taking part will increase their awareness of how their data (and the data of family members) is used. The wider benefit is that their input will help shape the wider research agenda and improve care for future neonates. There is a possibility that some participants might find the topics slightly distressing, but no other risk of negative impact.

Where is the study run from?
Imperial College London (UK)

When is the study starting and how long is it expected to run for?
September 2022 to January 2025

Who is funding the study?
1. CW+ (UK)
2. Medical Research Council (MRC) (UK)
3. National Institute for Health and Care Research (NIHR) (UK)

Who is the main contact?
Dr James William Webbe, j.webbe@imperial.ac.uk (UK)

Contact information

Type(s)
Public, Scientific, Principal investigator

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Additional identifiers

Integrated Research Application System (IRAS)
325606

Protocol serial number
JRC SG 002 2023-24

Study information

Scientific Title
Understanding the healthcare burden of illness in moderate-, late-preterm and term neonates: pilot stages

Study objectives
This is pilot work which will allow the creation of a data resource that can be used to assess the population healthcare burden of neonatal illness affecting moderate-preterm, late-preterm, and term neonates.

Epidemiological descriptive study
1. To describe the population of neonates born after 32+0 weeks+days admitted to neonatal care in England and Wales.
2. To map neonatal admissions in this population by patient factors (such as gestational age and ethnicity) and organisational factors (such as geographic region of birth and level of neonatal unit of admission)
3. To identify patient and care factors associated with unwarranted variation in patterns of neonatal admission.
4. To describe core outcomes in moderate-, late preterm and term neonates admitted to neonatal care in England and Wales.

Stakeholder engagement project
1. To understand former patient, parent, and societal perspectives on the linkage between existing data to evaluate the real-world impact of moderate-, late-preterm and term neonatal illness.
2. To obtain the qualitative data required for subsequent regulatory approvals for the overarching project (including Confidentiality Advisory Group approval)

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 01/02/2024, Wales REC 7 (Castlebridge 4, 15-19 Cowbridge Rd E, Cardiff, CF14 4XW, United Kingdom; +44 2922 940968; Wales.REC7@wales.nhs.uk), ref: 24/WA/0028

Primary study design
Observational

Study design
Two pilot stages of overarching data linkage work, consisting of a descriptive epidemiological study and stakeholder engagement project

Study type(s)
Other, Safety

Health condition(s) or problem(s) studied
Neonatal care provision in moderate-, late-preterm, and term neonates

Interventions
Epidemiological descriptive study
The background characteristics of admitted neonates will be described (including maternal, neonatal, and organisational factors) as will neonatal core outcomes.
Data source: De-identified data held in the National Neonatal Research Database (NNRD) will be used.
Background characteristics: Demographic data (e.g. sex, gestational age, year of birth), maternal factors (e.g. maternal age, pregnancy complications, receipt of antenatal steroids), neonate factors (e.g. Apgar score, admission temperature), and organisational factors (e.g. level of neonatal unit, neonatal network)

For the descriptive study, the population in question will be all moderately-, late-preterm and term neonates admitted to a neonatal unit. Approximately 90,000 neonates in this population are admitted each year, so over the seven-year study period, the sample size is anticipated to be around 630,000 neonates. This study will only use historical, deidentified data held with the National Neonatal Research Database, no new participants will be recruited. For the stakeholder engagement project, the sample size will vary at the different stages of the work:

For the focus groups, 24 participants will be recruited for four focus groups. Participants will include former neonates born after 32+0 weeks+days, parents (including mothers, fathers, parents of admitted neonates, and parents of neonates who did not require admission), healthcare professionals, and representatives of wider society. Participants will be selected purposively to include a broad range of backgrounds (including a range of ethnicities, educational statuses, and degrees of deprivation). Participants will be contacted for a short video call to discuss the focus groups and provide the information required to secure informed consent. Focus groups will then be facilitated by two trained members of the research team. The focus groups will take place in meeting rooms at Imperial College London and last 60 minutes.

For the online survey, participants will be recruited online. A target of at least 100 responses is expected. Participants will include former neonates born after 32+0 weeks+days, parents (including mothers, fathers, parents of admitted neonates, and parents of neonates who did not require admission), healthcare professionals, and representatives of wider society. This will include targeted recruitment of underrepresented groups (including minority ethnicities and economically disadvantaged groups). Participants will be able to complete the online survey at a time and place that suits them. It is expected to take 35 minutes.

For the in-depth interviews, 10 participants will be recruited for individual interviews. They will be identified from online survey participants who did not feel that the use of data linkage was appropriate. Cases will be purposively identified to provide a range of backgrounds among those invited to participate in individual interviews. Participants will be contacted for a short video call to discuss the interviews and provide the information required to secure informed consent.

Interviews will be run by two trained members of the research team. They will either be online or take place in meeting rooms at Imperial College London, whichever is more convenient for the participants and last for 60 minutes.

Intervention Type
Procedure/Surgery

Primary outcome(s)
Descriptive epidemiological study measured using de-identified data held in the National Neonatal Research Database (NNRD):
Survival to discharge home, defined as recorded as alive at final neonatal unit discharge

Stakeholder engagement project:
Qualitative data answering the following research question: Is it acceptable to former patients, parents, and wider society to link perinatal, childhood health, and education data without explicit consent (for the proposed neoOUTCOMES research project), measured using an online survey completed by stakeholders at one time point between September 2024 and January 2025

Key secondary outcome(s)
For the descriptive study the secondary outcomes are the following components of the neonatal core outcomes set:
1. Late-Onset Sepsis; defined in line with the Royal College of Paediatrics and Child Health National Neonatal Audit Programme (NNAP) definition “pure growth of a pathogen from blood” or “pure growth of a skin commensal” or a “mixed growth” after the first 72 hours of life and extracted from daily data at neonatal unit discharge
2. Necrotising enterocolitis; defined using the NNAP definition and extracted from daily data at neonatal unit discharge
3. Brain injury on imaging; defined in line with the UK Department of Health definition of neonatal brain injury and extracted from daily data at neonatal unit discharge
4. Retinopathy of prematurity; defined as a record of any retinopathy of prematurity on routine screening in the National Neonatal Dataset “retinopathy of prematurity ad-hoc form” and extracted from daily data at neonatal unit discharge
5. Bronchopulmonary dysplasia; defined using the NNAP definition of significant bronchopulmonary dysplasia and extracted from daily data at neonatal unit discharge
6. Blindness; defined as an answer of Yes to the question “Does this child have a hearing impairment?” on the NNAP form and extracted from data at 2 year (corrected age) review
7. Deafness; defined as an answer of Yes to the question “Does this child have a hearing impairment?” on the NNAP form and extracted from data at 2 year (corrected age) review
8. Ability to walk; defined as an answer of Yes to the question “Is this child unable to walk without assistance?” on the NNAP form and extracted from data at 2 year (corrected age) review

For the stakeholder engagement project, the secondary outcomes will include qualitative data addressing the following research questions, measured using online surveys and interviews completed by stakeholders at one time point between September 2024 and January 2025:
1. What are the perspectives of former patients, parents, and wider society on the linkage between existing data to evaluate the impact of neonatal care in neonates born after 32 weeks?
2. What concerns do former patients, parents, and wider society have with the proposed linkage work and how could they be alleviated?

Completion date
01/01/2025

Eligibility

Key inclusion criteria
1. For the descriptive study, the following population will be included:
Neonates born after 32+0 weeks+days postmenstrual age between 1st January 2015 and 31st December 2021 and admitted to a neonatal unit in England and Wales).
2. For the stakeholder engagement project, the inclusion criteria will differ for the different stages.
3. For the focus groups participants will include former neonates born after 32+0 weeks+days, parents (including mothers, fathers, parents of admitted neonates, and parents of neonates who did not require admission), healthcare professionals, and representatives of wider society without direct personal experience of neonatal care. Participants will be selected purposively to include a broad range of backgrounds (including a range of ethnicities, educational statuses, and degrees of deprivation).
4. For the online survey participants will include former neonates born after 32+0 weeks+days, parents (including mothers, fathers, parents of admitted neonates, and parents of neonates who did not require admission), healthcare professionals, and representatives of wider society without direct personal experience of neonatal care.
5. For the in-depth interviews, individuals will be identified who did not feel that the use of data linkage was appropriate during the online survey. Cases will be purposively identified to provide a range of backgrounds.

Participant type(s)
Healthy volunteer, Patient, Health professional, Carer, Other

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
0 Days

Sex
All

Key exclusion criteria
1. For the descriptive study, no neonates will be actively excluded.
2. For the stakeholder engagement project, no individuals will be actively excluded.

Date of first enrolment
01/03/2024

Date of final enrolment
01/03/2025

Locations

Countries of recruitment

United Kingdom

England

Study participating centre
Chelsea and Westminster Hospital Campus, Imperial College London
369 Fulham Road
London
London
United Kingdom
SW10 9NH

Sponsor information

Organisation
Imperial College London

ROR
https://ror.org/041kmwe10

Funder(s)

Funder type
Government

Funder Name
CW+

Alternative Name(s)
CW Plus

Funding Body Type
Private sector organisation

Funding Body Subtype
Other non-profit organizations

Location
United Kingdom

Funder Name
Medical Research Council

Alternative Name(s)
Medical Research Council (United Kingdom), UK Medical Research Council, Medical Research Committee and Advisory Council, MRC

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Funder Name
National Institute for Health and Care Research

Alternative Name(s)
National Institute for Health Research, NIHR Research, NIHRresearch, NIHR - National Institute for Health Research, NIHR (The National Institute for Health and Care Research), NIHR

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated and analysed during the current study will be available upon reasonable request: applications to use the data used within this project should be made to the Neonatal Data Analysis Unit, Imperial College London.

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol file	version 1 Study website	27/09/2023	18/12/2023	No	No

Study website	11/11/2025	11/11/2025	No	Yes